Botany report for
**Big Bar Hazardous Fuels Reduction Project**
(Short form Biological Evaluation/ Biological Assessment/ Noxious Weed Risk Assessment)

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My assessments, below, are based on Feather River RD GIS layers and other available records for survey areas, occurrences of species of conservation concern (rare plants: USFWS Listed Threatened or Endangered, FS Sensitive, and PNF Watch List), and infestations of non-native invasive plants (NNIP).

## PROJECT DETERMINATION SUMMARY

*Survey summary: COMPLETE.*

*Species of conservation concern (rare plants) summary:*

- *There are no concerns for species of conservation concern (USFWS Listed Threatened or Endangered, FS Sensitive, and PNF Watch List species) with implementation of Management Requirements during project implementation (see Appendix A).*

*Non-native invasive plants (NNIP) summary:*

- *Concerns about NNIP in the project area are being addressed as part of project design with an integrated pest management program that meets the purpose and need for the project (see Appendices A and B).*

## PROJECT DESCRIPTION

PROPOSED PROJECT ACTION AND DESCRIPTION.

Some areas along the 23N00 Road and 23N28 Road between Coyote Gap, Highway 70, and Big Bar Mountain, including Big Bar Mountain where the Forest Service lookout was consumed and the radio repeater destroyed in the Camp Fire (November 8-25, 2018) burned under high and mixed severity.

Big Bar Hazardous Fuels Reduction Project, PALS 56140. The project area occurs at elevations ranging between 3,000 and 4,400 feet. Legal Description: portions of Mount Diablo Meridian, T22N, R5E, sections 2-4, 9, and 10. The project includes mixed conifer species: ponderosa pine, white fir, incense cedar, sugar pine, Douglas-fir, tan-oak, and black-oak. The project proposes activities on approximately 736 acres within the project area (see Figure 1).

The proposal to remove fire killed trees that would become dangerous fuels, to reduce the risk or extent of, or increase the resilience to, wildfires.

- Salvage harvest of approximately 736 acres of dead and dying trees using conventional or mechanical tractor logging practices. Trees will be marked using the marking guidelines for fire-injured trees in California.
- Re-entry may occur up to 3 years to remove any additional danger trees for additional volume.

- Reforestation and maintenance activities include: site preparation which can include biomassing, hand-cutting, hand- or grapple-piling and pile burning; planting; grubbing after planting; and a variety of maintenance activities including mastication, hand-cut and hand- or grapple-pile, pile burning, prescribed fire, and targeted grazing. Maintenance could be needed for a period of 40 or more years.
- To protect water quality, roads will be modified by adding drainage structures such as critical dips, rolling dips, dips with leadoff ditches, and ditch relief culverts, and by out-sloping certain segments of road. Other activities include rocking inside ditches and rocking segments of road.
- The use of herbicides along with mechanical (cutting, pulling) treatments to control or eradicate non-native invasive plants (NNIP) and to prevent spread into new areas.

**SURVEYS**

The project area has been completely surveyed for plant species of conservation concern (USFWS T&E, FS Sensitive, and PNF Watch List) and non-native invasive plants (NNIP) by Forest Service botanists in 2019:

- 051103_2019_003 – in 2019 for this project (most of the project area)
- 051103_2019_004 – in 2019 for this project (Units 6, 24, 25)
- 051103_2019_006 – in 2019 for this project (Units 1, 2)

*Survey summary: COMPLETE.*

**SPECIES OF CONSERVATION CONCERN (RARE PLANTS)**

No species of USFWS Listed plants or Forest Service Sensitive plants are known from within the project area. Two species of Plumas NF Watch List plants are known from within the project area (Table 1). Table 1 includes notes about the acres of distribution of each species within the project area and Management Requirements to ensure that no significant impacts would result from project implementation. The specific Management Requirements are summarized in Appendix A.

Table 1. Forest Service Sensitive and Plumas NF Watch List plant species found within the project area.

| Scientific name | Common name | Manage-ment category[1] | Acres within project | Percent acres protected | Project design features[2] |
|---|---|---|---|---|---|
| *Clarkia mildrediae* subsp. *lutescens* | golden-anthered clarkia | Watch List | 1.78 | 71% [3] | Protect densest concentration of plants in Controlled Areas |
| *Lilium humboldtii* subsp. *humboldtii* | Humboldt lily | Watch List | 0.02 | 0% | No special protections needed |

[1] In general Forest Service Sensitive species have stricter management requirements due to their greater level of rarity and their designation as Sensitive by the Regional Forester (USDA Forest Service 2013), compared to Watch List species which are designated by the Plumas NF Forest Supervisor (USDA Forest Service 2014).

[2] See the Management Requirements summary below for details of these protocols.

[3] But this is 98% (1.27 acres) of the plants that occur in natural habitat conditions being protected.

- **Golden-anthered clarkia** (*Clarkia mildrediae* subsp. *lutescens* – PNF Watch List species).
  - This annual species is known from a total of 1.78 acres within project activity units. Within those units golden-anthered clarkia is known from a number of widely scattered occurrences along road edges and road cutbanks (about 0.49 acres), and from a large occurrence and a number of small occurrences in natural habitat clustered together just above the lower end of the 4-Trees Road (about 1.30 acres in project activity units 15 and 16).
  - Roadside occurrences are generally not protected from project activities, although those plants on road cutbanks are generally only potentially subject to road maintenance activities. Occurrences found in natural openings are preferentially protected, and these are often areas of sparse timber to completely open canopy and risk being used as landings and temp roads if not protected. For this project, one large botany Controlled Area that includes 1.27 acres of non-roadside occurrence is being protected from ground disturbing activities.
  - Although this species is generally visible from April to July, and often longer, it can only be identified to species in May and June to differentiate it from a common look-alike species (diamond clarkia - *Clarkia rhomboidea* - also found within the project area) and from two FS Sensitive look-alike species (Mosquin's clarkia - *Clarkia mosquinii*; Mildred's clarkia - *Clarkia mildrediae* subsp. *mildrediae*; neither is found within the project area). Golden-anthered clarkia grows best in somewhat open forest and generally does well in full sun. It also tends to do well following underburns or light fire.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
    *Evaluate all project activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology. Focus on protecting plants in natural openings from ground disturbance, although light ground disturbance outside of the growing season may be acceptable. Canopy removal and prescribed fire in and adjacent to occurrences is encouraged to open the habitat and to maintain suitable habitat.*
  - MANAGEMENT REQUIREMENTS for golden-anthered clarkia. An adequate amount of the occurrences of golden-anthered clarkia will be protected within a Botany Controlled Area – see Appendix A for Controlled Area details.

- **Humboldt lily** (*Lilium humboldtii* subsp. *humboldtii* – PNF Watch List species).
  - About 0.02 acres of Humboldt lily are found within project activity units (units 15 and 16 along the lower end of 4-Trees road, close to the golden-anthered clarkia plants that are also found within those two units). These Humboldt lily plants are all associated with road edges and road cutbanks, habitats not generally protected for this species.
  - Although this species is generally visible from April to July, and often longer, it can only be identified to species in June through July to differentiate it from a common look-alike species (Washington lily - *Lilium washingtonianum* subsp. *washingtonianum* - also found within the project area although at generally higher elevations than Humboldt lily). Humboldt lily grows best in somewhat open forest and generally does well in full sun. It also tends to do well following underburns or light fire.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
    *Evaluate all project activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology.*
  - Because the Humboldt lily plants within the project area are a very small acreage, and they occur in sub-optimal habitat that only occasionally is affected by project activities, no special protections are needed at this time.
  - MANAGEMENT REQUIREMENTS. None needed at this time for this species.

*Species of conservation concern (rare plants) summary:*

- *There are no concerns for species of conservation concern (FS Sensitive or PNF Watch List species) with implementation of the Management Requirements that are built into the project design (see Appendix A).*

**NON-NATIVE INVASIVE PLANTS (NNIP)**

No non-native invasive plants (NNIP) are known from within this project area at this time. See Appendix A, Management Requirements, for measures to prevent the inadvertent introduction of NNIP into this area, and to treat them if found (early detection and rapid response). Treatment would include a program of integrated pest management that includes the use of both mechanical and chemical (herbicide – see Appendix B) means to control or eliminate new infestations of NNIP.

*Non-native invasive plants (NNIP) summary:*

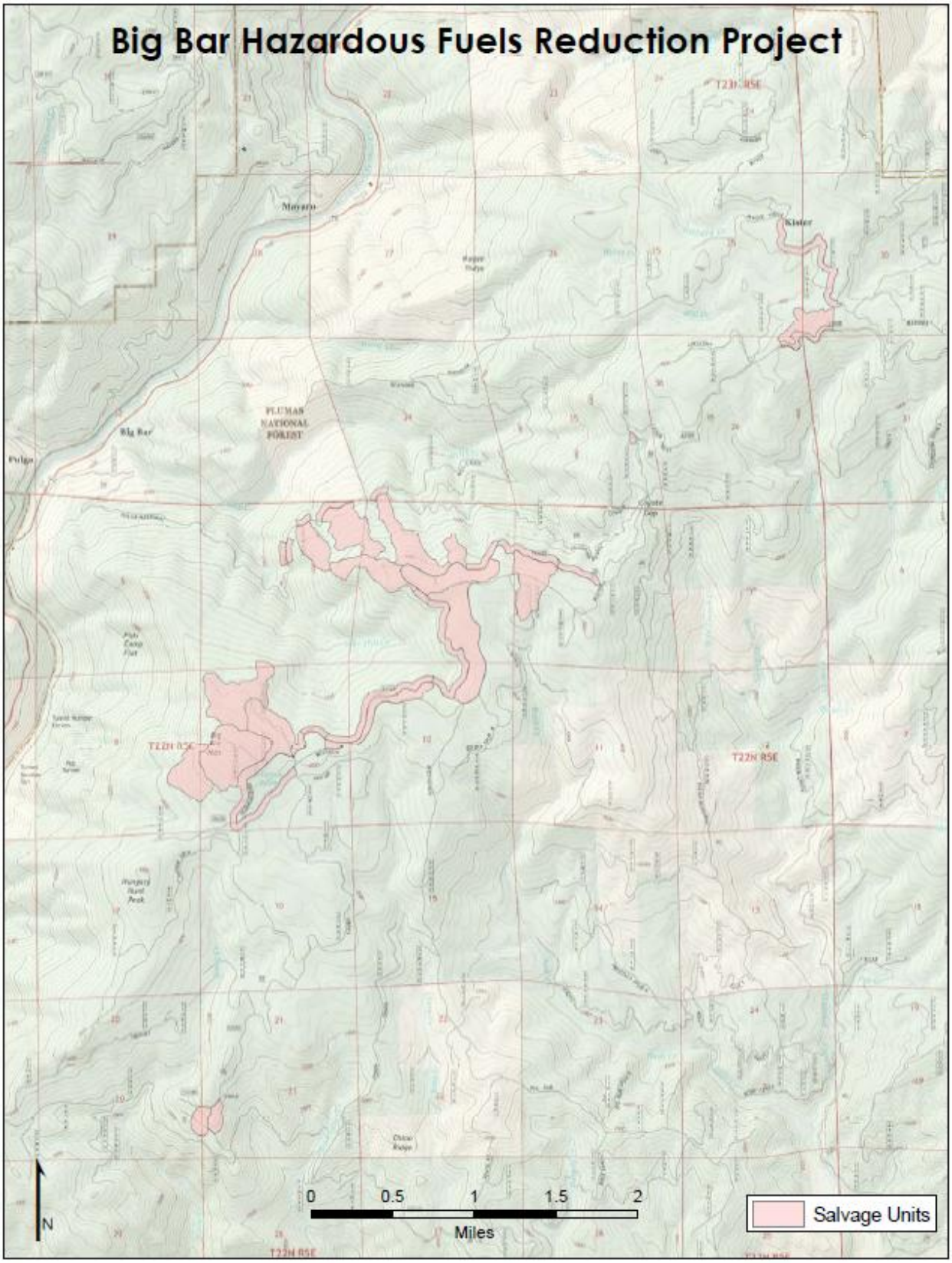
- *Concerns about NNIP in the project area are being addressed as part of project design with an integrated pest management program that meets the purpose and need for the project (see Appendices A and B).*

**REFERENCES**

USDA Forest Service. 2013. 2013 Sensitive Plant List. Pacific Southwest Region, Region 5. Letter from Regional Forester Randy Moore. File Code: 2670. Dated July 3, 2013.

USDA Forest Service. 2014. Plumas National Forest Interim Management Prescriptions for Threatened, Endangered, Sensitive and Special Interest [Watch List] Plants. Memo from Earl W. Ford, Forest Supervisor, to District Rangers. Dated October 16, 2014.

Figure 1. Big Bar Hazardous Fuels Reduction Project activity units (pink).



**APPENDIX A**
**BOTANY Management Requirements for the Big Bar Fire Salvage Project.**

| Potential Resource(s) Affected | Management Requirements Designed to Reduce or Prevent Adverse Effects | Responsible Person(s) |
|---|---|---|
| Rare Plants - Conservation | BOTANY CONTROLLED AREAS (CAs) have been established for the protection of one species of rare plants.<br>• NO HEAVY EQUIPMENT or other vehicles allowed on the ground within CAs (equipment reaching into a CA to retrieve logs, or pulling logs out of a CA, or similar, is ok); no burn piles (lop-and-scatter within CAs, remove as much slash as practical to burn piles outside of CAs); no herbicide use; no site prep, planting, or timber stand maintenance. | Botanist, Project Implementation Teams, Contract Administrators |
| Rare Plants - Conservation | BOTANY CONTROLLED AREAS will be shown on the project implementation maps, and be flagged on the ground by red-and-black-stripe and blue-and-black-stripe flagging always tied together.<br>• Contact the District Botanist prior to project implementation to ensure that flagging is in place and refreshed as necessary. | Botanist, Implementation Team, and Contract Administrator |
| Rare Plants - Conservation | No herbicide use is allowed within 50 ft of any rare plants regardless of whether the rare plants are included within a botany Controlled Area. | Botanist, Implementation Team, and Contract Administrator |
| Non-native Invasive Plants (NNIP) - Prevention | Ensure that all plant material and fill material used for erosion control and/or road maintenance is free of NNIP, including straw, mulch, gravel, and rock (*certified weed-free*). | Botanist, Implementation Team, and Contract Administrator |
| Non-native Invasive Plants (NNIP) - Prevention | Clean all off-road equipment entering the project area if it may be coming from areas infested with nonnative invasive plants (NNIP). | Botanist, Fuels Officer, Project Implementation Teams, Contract Administrators |
| Non-native Invasive Plants (NNIP) - Prevention | To the greatest extent feasible keep all equipment, vehicles, and supplies out of areas of known NNIP infestations, including any NNIP infestations along access routes and new infestations that may be discovered during project implementation. NNIP infestations may sometimes be flagged with bright orange “noxious weed” flagging.<br>• Any equipment, vehicles, and supplies that do come in contact with NNIP infestations (plants or the ground close to them) during project implementation should be thoroughly cleaned of dirt, mud, and plant debris before entering any un-infested project area.<br>• Hand cutting of broom plants and placement of burn piles on top of NNIP infestations is encouraged.<br>• New infestations should be mapped and reported to the District Botanist. | Botanist, Fuels Officer, Project Implementation Teams, Contract Administrators |

| Potential Resource(s) Affected | Management Requirements Designed to Reduce or Prevent Adverse Effects | Responsible Person(s) |
|---|---|---|
| Non-native Invasive Plants (NNIP) - Prevention | Members of the project implementation teams (layout crew, contract administrator, etc.) should watch for and be able to recognize NNIP.<br>• As time allows, pull some or all of NNIP encountered during project activities (avoiding Archaeology controlled areas).<br>• New infestations should be mapped and reported to the District Botanist, and flagged and avoided. | Botanist, Project Implementation Teams, Contract Administrators |
| Non-native Invasive Plants (NNIP) - Prevention | Monitor areas of project related ground disturbance (e.g. skid trails, temp roads, landings, trails, etc.) for NNIP for up to 10 years following implementation of each project activity.<br>• As funding becomes available, new and old infestations of NNIP should be pulled or otherwise treated.<br>• New infestations should be mapped and reported to the District Botanist. | Botanist and Implementation Team |

**Appendix B**
**General Herbicide Use Design Features**

If a program of integrated pest management that includes the use of herbicides becomes part of the Big Bar Fire Salvage Project, the following design criteria to protect human health, water quality, and natural resources will be incorporated into the proposed action. Herbicides would be applied in accordance with: 1) product label directions; 2) California Department of Pesticide Regulation requirements; 3) Forest Service best management practices for water quality (USDA Forest Service 2011); and 4) Forest Service direction (FSM 2900, 2150 and 2200) and Handbook (FSH 2109.14). This project will include a Pesticide Use Spill Plan. Prior to any herbicide use, a Pesticide Use Proposal (PUP) (FS-2100-2) and safety plan (FS-6700-7) will be completed by the project leader and approved by the Responsible Official. These documents will be included in the project record.

- Specific design features, best management practices, and mitigation measures are summarized in the table below.
- A June 20, 2014, Presidential Memorandum recommends additional best management practices to promote the health of honey bees and other pollinators. To address this recommendation, the U.S. Department of Agriculture and U.S. Department of the Interior have developed best management practices to protect pollinators when implementing management activities, including pesticide treatments (USDA and USDI 2015). Although not yet required, these best management practices would be followed and are consistent with the project design features for this project.

Two common herbicides are discussed below, but other commercially available herbicides may be used instead of or in addition to these, depending on the species of non-native invasive plants being treated.

**Triclopyr** (trade names include Garlon™ 3A, Milestone VM Plus). This herbicide provides pre-and post-emergence control of woody and broadleaf plants and re-sprout control as stump treatment on woody plants. It is selective and has little impact on grasses. It can reside in soils for up to 6 months. Triclopyr can be used in combination with aminopyralid in a pre-mixed formulation (e.g. Milestone VM Plus).

**Glyphosate** (trade names include Accord®, Aquamaster®). This is one of the most widely used herbicides available. It is non-selective (broad spectrum), so it may injure non-target plants. It provides only post-emergent control and is not absorbed through roots. It is non-persistent and relatively immobile in soil, although it can remain in soil for 4 to 8 months. This non-persistence and relative immobility in the soil means that glyphosate is often the most environmentally benign of the commonly used herbicides. Plants treated with glyphosate can take several weeks to die; repeat application is often necessary to remove plants that were missed during the first application.

- There has been some controversy and public alarm recently concerning safety issues in the use of glyphosate. Disparate reporting by various public agencies and NGOs regarding potential risks to applicators and to the public has led to much confusion around this issue. The California Invasive Plant Council (Cal-IPC), a non-profit organization, has prepared a "fact sheet and position statement" summarizing all best-available science and policy on this issue (Cal-IPC 2017). Cal-IPC summarizes its policy on the use of glyphosate thus: "Cal-IPC supports the use of glyphosate in invasive plant management as part of an of Integrated Pest Management (IPM) approach. When using glyphosate according to the label, with appropriate personal protective equipment and best practices, glyphosate is low-risk for wildlife, applicators and the public."

| ID | Project design feature | Purpose |
|---|---|---|
| 1 | Herbicide application will comply with product label directions and applicable legal requirements. | To avoid or minimize the risk of soil, surface water, or groundwater contamination.<br>To minimize risk to special status plants and wildlife as well as other biological resources.<br>To ensure compliance with legal requirements.<br>Compliance with BMP 5.8 (USDA Forest Service 2011) |
| 2 | Herbicide formulations would be limited to those containing one or more of the following five active ingredients: aminocyclopyrachlor, aminopyralid, chlorsulfuron, clopyralid, and triclopyr. | To minimize potential adverse effects on workers, forest users, and resources. |
| 3 | Herbicide applications would only treat the minimum area necessary to meet site objectives. | To minimize potential adverse effects on workers, forest users, and resources. |
| 4 | Herbicide application methods are limited to select (e.g. low pressure hand sprayer, wicking, wiping, stem injection) and directed spray (use of backpack sprayer or hand held nozzle to aim application at specific target species), as permitted by the product label and project design features. No aerial herbicide applications will occur (USDA and USDI 2015). | To minimize potential adverse effects on workers, forest users, and resources. |
| 5 | Spray application drift control measures:<br>1) Only ground based equipment will be used<br>2) All applications will cease when weather conditions exceed those on the label<br>3) Applications will not be performed when the National Weather Service forecasts a greater than 70 percent probability of measurable precipitation (greater than 0.1 inches) within the next 24 hour period<br>4) Applications will cease when wind speed exceeds 10 mph<br>5) Spray nozzles will produce a relatively large droplet size (500-800 microns)<br>6) Low nozzle pressures will be used (15 psi)<br>7) Spray nozzles will be kept within 24 inches of target vegetation during spraying<br>8) A pressure gauge or pressure regulator will be required on each backpack sprayer | To minimize the risk of pesticide drift onto water or non-target areas, in order to minimize impacts to water quality, special status plants and wildlife, non-target vegetation, and other biological resources (e.g. pollinators, aquatic organisms).<br>Compliance with BMP 5.13 (USDA Forest Service 2011) and BMPs regarding pollinators (USDA and USDI 2015) |
| 6 | Herbicides will be applied by trained and/or certified applicators in accordance will label instructions and applicable federal and state pesticide laws. Mixing of herbicides will be supervised onsite by, at a minimum, a Qualified Applicator certified by the State of California. | To establish the level of trained / certified personnel for herbicide applications. |
| 7 | Personal Protective Equipment (PPE) will be used in accordance with the product label and California Department of Pesticide Regulation requirements. | To minimize potential adverse effects to workers. |
| 8 | Chemicals will be stored in designated storage facilities consistent with FSM 2109.14, Chapter 40.<br>Unused herbicides will be disposed of in accordance with the product label and FSM 2109.14, Chapter 40.<br>If the product label and FSM differ, the more restrictive storage and disposal guidelines will be followed. | To minimize potential adverse effects on workers, forest users, and resources.<br>Compliance with BMP 5.11 (USDA Forest Service 2011). |
| 9 | No directed spray or broadcast herbicide application will occur on weekend days between Memorial Day and Labor Day in recreation sites (campgrounds, trailheads, and dispersed camping areas). | To minimize potential adverse effects on forest users. |
| 10 | For herbicide treatment within 100 feet of recreation sites (campgrounds, trails, and trailheads), cautionary notice signs will be posted at the recreation site prior to herbicide treatments. | To inform and to minimize potential adverse effects on forest users. |

**APPENDIX B REFERENCES**

Cal-IPC. 2017. California Invasive Plant Council Cal-IPC. Cal-IPC Fact Sheet and Position Statement – The Use of Glyphosate for Invasive Plant Management. www.cal-ipc.org/wp-content/uploads/2017/11/Cal-IPC-glyphosate-policy.pdf

USDA Forest Service. 2011. Best Management Practices (BMP) Soil and Water Quality Management Handbook Amendment - 2509.22_10. FSH Amendment, Vallejo: USDA Forest Service, Vallejo, CA.

USDA and USDI. 2015. Pollinator-Friendly Best Management Practices for Federal Lands. US Department of Agriculture and US Department of Interior, May 11, 2015 (In response to Presidential Memorandum of June 20, 2014). Available online: http://www.fs.fed.us/wildflowers/pollinators/BMPs/